REMARKS

In accordance with the foregoing, claims 1 and 18 have been amended. Claim 17 has been cancelled. Claims 8-16 and 19-50 have been withdrawn. Claims 1- 16 and 18-50 are pending and under consideration.

REJECTION UNDER 35 U.S.C. §102:

Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Gotoh et al. (US Patent No. 5,801,765).

The Office Action sets forth that Gotoh et al. discloses the prior art histogram based scene change detector. The detector comprises a first and second color histogram detection units (102) computing histograms from input first and second color signals respectively. Furthermore, Gotoh et al. teaches a cross correlation coefficient calculation unit (105 and 106) calculating a correlation value between the first and second histograms computed by the first and second histogram detection units, respectively; and a decision unit outputting a scene change signal by comparing the correlation value with a threshold (107)(Col Line 53-Col 2 Line 14).

By way of review, Gotoh et al. discloses "[b]rightness information for each pixel is quantized up to a prescribed level, and a brightness histogram for one frame is made by a histogram creation means 102", however fails to disclose "first and second histogram detection units computing histograms from input first and second color signals, respectively."

Furthermore, Gotoh et al. discloses "A histogram difference and absolute operation means 105 calculates the difference between two histograms for each section of brightness level to give its absolute value, by using the contents of the two histogram storage means 104, i.e., the histograms of the frame under processing and of the previous frame. A histogram differential sum operation means 106 gives the sum of the difference absolute values being the results of the histogram difference and absolute value operation means 105"(col. 1, line 65-col. 2, line 4), however, fails to disclose "a cross correlation coefficient calculation unit calculating a correlation value between the first and second histograms computed by the first and second histogram detection units, respectively" as recited in claim 1.

As such, it is respectfully submitted that Gotoh et al. does not disclose the invention recited in claim 1.

Regarding claim 5, the Office Action sets forth that Gotoh et al. discloses "wherein the first and second histogram detection units quantize the input first and second color signals to signal bands, respectively, each calculate the number of pixels having the same values of the quantized first and second color signals with respect to all pixels in a predetermined frame region, and

calculate the first and second histograms by standardizing the calculated respective numbers, respectively."

By way of review, Gotoh et al. merely discloses "a brightness histogram for one frame is made by a histogram creation means 102(col. 1, lines 58-60) however fails to disclose "each calculate the number of pixels having the same values of the quantized first and second color signals with respect to all pixels in a predetermined frame region, and calculate the first and second histograms by standardizing the calculated respective numbers, respectively" as recited in claim 5.

Accordingly, it is respectfully submitted that Gotoh et al. does not disclose the invention recited in claim 5.

Claims 1-7, 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakajima (U.S. Patent No. 5,719,643).

Regarding claims 1 and 2, the Office Action sets forth that Nakajima teaches "the use of a first and second frame buffers (1 and 2) storing two image frame data, respectively, to detect a scene change; and a first and second color space conversion units (3 and 4) converting the image frame data stored in the first and second frame buffers into the first and second color signals to be outputted to the first and second histogram detection units."

By way of review, Nakajima merely discloses "the contracted image processing units 3 and 4 then produce contracted image of luminance and chrominance data on the basis of the average values thus obtained. More particularly, the contracted image processing unit 3 produces contracted image of luminance and chrominance signals as shown in FIGS. 3B and 3C"(col. 4, lines 52-57) however, fails to disclose "a cross correlation coefficient calculation unit calculating a correlation value between the first and second histograms of the first and second frame color signals computed by the first and second histogram detection units, respectively" as recited in claim 1.

Furthermore, claim 2 recites "first and second color space conversion units converting the image frame data stored in the first and second frame buffers into the first and second color signals to be outputted to the first and second histogram detection units."

However, Nakajima discloses "designated at 5 is an inter-frame difference unit for receiving luminance signal contracted image from the contracted image process units 3 and 4 and obtaining, from the received contracted image."(col. 4, lines 6-10) but fails to disclose "first and second color space conversion units converting the image frame data stored in the first and second frame buffers into the first and second color signals to be outputted to the first and second histogram detection units, respectively" as recited in claim 2.

As such, it is respectfully submitted that Nakajima does not disclose the invention recited in claims 1 and 2.

Regarding claims 3 and 4, the Office Action sets forth that Nakajima discloses the color signals are luminance and chroma signals (Col 4, lines 4-7)

By way of review, Nakajima discloses "[a] still further feature of the invention resides in determining a cut frame from a temporal change in the inter-frame luminance difference of an input video frame and a temporal change in the chrominance histogram correlation of the input frame, obtaining the chrominance histogram correlation among detected cut frames, and judging a cut frame group from the chrominance histogram correlation among the cut frames."

As such, Nakajima discloses a scene change detector using both luminance signal and chrominance signal but fails to disclose a scene change detector using either luminance signal or chrominance signal.

Accordingly, it is respectfully submitted that Nakajima does not disclose the invention recited in claims 3 and 4.

Regarding claim 5, the Office Action sets forth that Nakajima discloses the histogram each calculate the number of pixels having the same values of the quantized first and second color signals with respect to all pixels in a predetermined frame region."

By way of review, Nakajima discloses "it is assumed that each element data of the contracted image of the chrominance signals U and V obtained in the contracted image processing units 3 and 4 consists of 8 bits, for instance. The chrominance histogram correlation unit 8 divides the contracted image of chrominance signal U, V of the frame which has been judged to be a cut frame candidate in the first embodiment into 8 divisions in a range of .+-.Θ. with respect to U, V=128 and takes a histogram $H_{n,j,k}$, where n is the frame number, and j and k area numbers of U and V and j, k=1, . . . , 8. Since the maximum value of the 8-bit element data is 255, as shown in FIG. 5, the division of the contracted image into 8 divisions is made in a range of .+-..Θ. with respect to 128, one half the maximum value. Here, .theta. is a predetermined constant and may, for instance, be .theta.=32. The area numbers of the 8 divisions of U and V are denoted by j and k. The histogram $H_{n,j,k}$ is then defined as follows. When j=1 and K=1, for instance, $H_{n,1,1}$ represents the number of element data such that DU and DV are numbers of chrominance element data. FIG. 6 shows an 8.times.8 chrominance histogram matrix of $H_{n,j,k}$ which is obtained in the above way." However, Nakajima fails to disclose "each calculate the number of pixels having the same values of the quantized first and second color signals with respect to all pixels in a predetermined frame region, and calculate the first and second histograms by standardizing the calculated respective numbers, respectively" as recited in claim 5.

In addition, claims 6 and 7 are deemed to be patentable due at least their depending from claim 1, as well as for the additional recitation therein.

Regarding claim 17, the Office Action sets forth that Nakajima teaches "converting the stored two frame data into the first and second color signal(A and B, Fig. 2)"

Claim 17 has been amended to clarify the present invention.

By way of review, Nakajima discloses "output of the contracted image processing unit 3 and 4 is contracted image of chroma signal and luminance signal" but fails to disclose "computing first and second histograms with respect to input first and second frame color signals" as recited in amended claim 17.

Accordingly, it is respectfully submitted that Nakajima does not disclose the invention recited in claim 17.

REJECTION UNDER 35 U.S.C. §103:

Claims 6, 17 and 18 are rejected under U.S.C 103(a) as being unpatentable over Gotoh et al. (U.S. Patent No. 5,801,765) in view of Park (US Patent 6,995,805).

The Office Action acknowledges that Gotoh et al. fails to disclose "the detecting a scene change when a correlation value is lower than a threshold." However, the Office Action sets forth that Park teaches a scene change detector using histograms wherein the scene change is detected when a correlation value is higher than a threshold (TA and TC) and lower than a threshold(TB)(Col 6 lines 47-67, col 7 line 32-46, col 7 line 62- col 8 line 24, Figs. 5 and 6)

By way of review, Gotoh et al. discloses "a video for one frame is captured and two adjacent frames are compared, the result of which is detected as a change degree of the video. Then, based on the magnitude of the change degree, it is determined whether a scene change (SC) exists."(abstract)

As such, in Gotoh et al., in order to determined whether a change degree of the video, one frame and two adjacent frames are required, however, in present invention, to determining to check scene change one frame and only an adjacent frame required.

Furthermore, Park discloses "determining whether the metrics of successive ones of each of a first plurality of frames, successively following the candidate frame, differ from one another by less than a second threshold, and further determining whether the metrics of each frame of a second plurality of frames, successively preceding the candidate frame, are larger than a third threshold."(abstract) In order to detect scene change, Park requires plurality of frames to determine scene change.

Accordingly, it is respectfully submitted that the combination of Gotoh et al. and Park does not teach or suggest the invention recited in claim 6.

Regarding claims 17 and 18, the Office Action sets forth that Gotoh teaches "the storing two image frame data separately to detect the scene change (2, Fig. 5). Note: the frames are stored at different times and therefore are stored separately."

Claim 17 has been canceled without prejudice or disclaimer.

Claim 18 have been amended to incorporated the features of canceled claim 17.

By way of review, Gotoh et al. discloses "[s]pecifically, in Step 3, a video signal is captured into a frame memory. Suppose that total time from Step 3 through Step 12 is defined as At, a frame is to be captured every Δt. With reference to FIG. 3, squares aligned in the direction of time lapse designate 30 frames per second, and also illustrates a frame into which a colored frame is captured. This figure represents one capture for three frames, i.e., αt=0.1 sec. Hereinafter the brightness information of a frame (for one screen) captured in the time ($t0+\tau\ \Delta t$) is referred to as $Y(\tau)$ for simplicity." (Col. 5, line 59 to col. 6 line 2). As explained in Gotoh et al., three frames are required to be captured for detecting scene changes however fails to disclose "storing two image frame data separately to detect the scene change; and converting the stored two frame data into the first and second color signals."

Accordingly, it is respectfully submitted that the combination of Gotoh et al. and Park does not teach or suggest the invention recited in claim 18.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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